

Final Project Report(to be submitted by 30th September 2016)

Instructions:

- Document length: maximum 10 pages, excluding this cover page and the lastpage on project tags.
- Start with an abstract (max 1 page).
- Final report text: Do not forget to mention your methodology;the people involved (who, how many, what organization they are from – if applicable); andthe expected added value for biodiversity, society and the company. Finally, state whetherthe results of your project can be implemented at a later stage, and please mentionthe ideal timing and estimated costs of implementation.
- Annexes are allowedbut will not be taken into account by the jury and must be sent separately.
- Word/PDF Final Report files must be less than 10 MB.
- If you choose to submit your final report in your local language, you are required to also upload your final report in English if you wish to take part in the international competition.
- To be validated, yourfilemust be uploaded to the [Quarry Life Award website](#) before **30th September 2016** (midnight, Central European Time). To do so, please log in, click on 'My account'/ 'My Final report'.
- In case of questions, please liaise with your national coordinator.

1. Contestant profile

▪ Contestant name:	Abdulah Šljivo, Dalila Marušić, Kemal Delibašić
▪ Contestant occupation:	Profesor, magistar poljoprivrede, student
▪ University / Organisation	NGO "Green field"
▪ E-mail:	
▪ Phone (incl. country code):	
▪ Number of people in your team:	3

2. Project overview

Title:	"Caution is the mother of wisdom"
Contest:	Quarry Life Award
Quarry name:	Ribnica
Prize category: (select all appropriate)	<input checked="" type="checkbox"/> Education and Raising Awareness <input checked="" type="checkbox"/> Habitat and Species Research <input checked="" type="checkbox"/> Biodiversity Management <input type="checkbox"/> Student Project <input type="checkbox"/> Beyond Quarry Borders

Abstract (max 1 page)

Non-governmental organization „Green field“ is a non-profit organization which is directed to protecting the environment and raising public awareness for responsible attitude towards nature.

It was created in 2011, bringing together young people, students, unemployed on the same path – path of environmental protection. NGOs participated in a series of environmental projects and environmental actions in the wider area of Kakanj and Zenica-Doboj Canton, such as reforestation in the project „Let's do it“, „1.000.000 seedlings for one day“, „Clean up the planet earth for one day“, „No to illegal dumps“, „Selection of packaging waste at source“, „Recycling of electronic waste“, „Introduction of eco stewards in schools“, „Recycling of burnt engine oil“, „Participatory budgeting“ – with World Vision.

In this cycle of competition "The Quarry Life", NGO „Green field“ with project „Caution is the mother of wisdom“ prepared the ground for intensively preoccupation with mushrooms on this area by the public and professionals, and also we prepared the possibility of forming Association of Mushroom Collectors within the Association of Agricultural in Kakanj municipality. On the other hand Kakanj Cement and Heidelberg company once again gave support to environmental projects and the protection of biodiversity. We have organized education trainings and workshops with students, where we presented to them all positive things of quarry „Ribnica“ like its biodiversity. Also we had interview with the representative of the Association of Agricultural producers "KAP" Kakanj we came up with the idea to create a special section that will gather mushroom collectors from municipality of Kakanj. They decide to help us, and it will be one center where you can find all needed informations about mushrooms, ll of that is to achieved the goal – how to save mushroom diversity, and how to pick them properly.

On picture 1. is presented a marginal field exploitation of area quarry „Ribnica“, with which we took soil samples for analysis, in order to verify benefits for mushroom development in such a habitat.



Picture 1. Quarry „Ribnica“

Final report (max 9 pages)

INTRODUCTION:

Under the mushrooms, in mycology, imply all kinds of heterotrophic microorganisms, and under agarics only the fleshy fruitful body of *Basidiomycotina* built from the hat and the handle. Fossil remains testify to the lower species still occurs in Paleozoic, and more in Mesozoic, before 235 million years ago. Stone monuments in the form of a mushroom from India and Latin America, old 2-3000 years speak about the connection between people and mushrooms. In the bag of "Ice man" discovered in glacier of Austria, who lived 5,300 years ago, are discovered two mushrooms: *Fomes fomentarius* and *Piptoporus betulinus*. These mushrooms have been used for lighting fires and for treatment.

It is believed that today there are 1.5 million species of mushrooms, and around 7,000 species of agarics. Mushrooms are generally short-lived, from a few hours up to ten days. Some of them live from 10 to 20 years, even up to 600 years. Mushrooms, generally respect the calendar of applying, which means that certain types appears only at certain times of the year. In some cases, certain types may appear longer period during the year, for example *Agrocybe aegerita* that grows from middle of March to December in 3 or 4 cycles.

Due to the rapid growth of mushrooms they suck large quantities of water from the soil, so the water is from 90% to 95% of the total body weight. On the mushroom cells of act a lot of pressure and up to 7 atmosphere. A large number of mushroom species contains a large number of medicinal ingredients that are used in human medicine, and the most famous are the order *Penicilinium* and *Aspergillus*.

Picture K.R.2 shows the principle of multiplication of mushroom



Picture 2. Principle of mushroom multiplication

GOALS AND METHODS:

Goal 1: Locate and analyze all types of mushrooms in the wider area of the quarry Ribnica for further scientific research:

- To achieve this goal, we used three methods: 1) Meetings and talks to local population who have in any way been in contact with mushrooms; 2) explore the area around the quarry Ribnica in periods when we can expect mushrooms; 3) soil analysis by the Federal Institute for Agropedology, with special emphasis on the content of the elements in the soil favorable for mushroom growth.

Goal 2: Education of citizens of Kakanj with the species of fungi, their habitat and way of harvesting in an environment of quarries „Ribnica“.

- In pursuit of this objective, we used methods like lectures, interactive workshops and divisions brochure in Primary and Secondary schools, agriculture producers, mountaineers, and weekend visitors on excursion site in Kakanj. Within this objective, there was an initiative to form a special Section of mushroom collectors under the Association of agriculture producers Kakanj.

BASIC INFORMATION ABOUT THE PLACE OF RESEARCH:

Kakanj municipality, with an area of 462 km² is located in the valley of the river Bosna and its tributaries Ribnica, Trstionica and Zgošća, at a height from 380 to 1458 meters of altitude. Municipality Kakanj has a central position in the Sarajevo-Zenica valley, the most important economic region with densely populated areas.

Quarry „Ribnica“ is located about six kilometers northwest from Kakanj, at an altitude between 405 and 685 metres, with an area of 23.2 hectares, with the possibility of further extension for an additional 59.2 ha.

Municipality Kakanj is characterized by continental climate, and average water temperature in year is over 10 °C. The coldest month is January with a negative average temperature of -0.3 to -3 °C, while the warmest month is July with an average temperature above 18 °C. Summers are moderately warm and winters moderately cold. Annual precipitation ranges from 800 mm to 950 mm, and it is relatively evenly distributed with relative fluctuation of about 4%. These parameters, temperature and rainfall, talk about favorable conditions for the mushroom growth in the environment of quarry „Ribnica“.

RESULTS:

To achieve the first goal, we use the method of talks and meetings with the local population that lives surrounding the quarry „Ribnica“. This includes population of the village Donji Kakanj, Ribnica, Mramor, Vrlište and Subotinje. The respondents were answering the questions that are exclusively related to the knowledge of mushrooms, about the experiences that they have in the consumption of edible mushrooms, about their knowledge about safe recognition of edible from poisonous mushrooms, and about that which parameters they use to collect mushrooms.

We came to the conclusions that the local population know about mushrooms inherited from their ancestors or close relatives, or that the same is transferred from generation to generation. This knowledge is directed to that that only in certain times, and after a short period of rainfall, they may encourage them to pick wild mushrooms for consumption or sale. This includes Lactarius, Caesar's mushroom, porcini, chanterelle and sorghum. The picture K.R.3. are presented mushrooms in this order, and they are the most popular to this local population. Each of these mushrooms are expected at the exact same time of year, then in a precise type of woods, such as oak, beech or hornbeam forests

The experience of the locals go to the meticulous selection of age for individual fungi, while they rejects older specimens, arguing that in their content there is more harm than good. Experienced mushroom collectors will taste Lactarius in the raw state, for added security, because some residents are classified in semi edible mushroom, and that means consuming only after the heat treatment. In every meeting with the locals we were convinced that ther respect the tenth mushroom command "Caution is the mother of wisdom."

A small percentage of residents have the knowledge of identifying mushrooms that have commercial value. This group includes porcini, chanterelles and Caesar's mushroom.

In an environment of quarry „Ribnica“ there are 27 species of boletus mushrooms, some of which are semi poison or toxic. A small number of boletus subspecies attracts the attention of collectors, what motivates residents to collect mushrooms intensively.



Picture 3. Lactarius, Caesar's mushroom, porcini, chanterelle and sorghum

The wider area of the quarry „Ribnica“ has a considerable specimens of the summer (black) and white (autumn) truffle. Truffle is among the highly sought mushroom in the world market. It is used as a condiment or seasoning, has anticancer properties, strengthens the immune system and he is a strong aphrodisiac.

Population concluded that in the forests around the quarry „Ribnica“, is more poisonous mushrooms, than edible or semi edible. The reason is that poisonous mushrooms are intact until their maturity. This allows them to reproduce without interference. With edible mushrooms, the number of found copies is smaller, partly because of frequent harvesting and because of improper collection of mushrooms, which destroys parts of mushrooms for reproduction.

Second method for achieving the first goal is field search and comparison of founded copies with literature data. On this occasion we met a series of edible, or poisonous and deadly poisonous mushrooms.

Poison mushrooms are:



Picture 4. *Omphalotus olearius*



Picture 5. *Amanita muscaria*

The effect of the poison *Amanita muscaria* also occur fairly quickly after eating. Patients are confused, have symptoms similar to epilepsy. Some addicted to drugs consume this mushroom to cause the desired psychological symptoms of intoxication. But an overdose of toxins can lead to death.



Picture 6. *Russula emetica*



Picture 7. *Cortinarius orellanus*

Cortinarius orellanus is also dangerous poisonous mushroom. The problem is that the poison begins to act only after a few days (to weeks), which complicates diagnosis. Poisoning leads to kidney failure and death even at best case dialysis as a result.



Amanita phalloides is one of the most poisonous mushrooms, widespread in Europe and causes poisoning with deadly consequences, for children in 100% of cases. She causes damage to the liver and kidney failure, caused by the action of a very dangerous poison amatoxin and alpha-amanitin.

It grows in deciduous and coniferous forests from summer to autumn. *Amanita phalloides* is subject of much research. Until now many active ingredients are isolated, including the alpha-amanitin. Damages the liver and kidneys, cure against poisoning is not known.

Picture 8. *Amanita phalloides*

Amanita phalloides is extremely toxic and it is responsible for most deadly mushroom poisoning.

It is estimated that 30 grams of *Amanita phalloides* is enough to cause the death of a man. It is strongly suggested that you do not put *Amanita phalloides* in a basket with other edible mushrooms and to avoid touching each other.

Toxicity of this mushroom is not reduced by cooking, freezing or drying; toxicity is stable, and the first signs are usually late visible. The fact that the first signs of poisoning see after 8-27 hours makes it particularly dangerous. The symptoms can be seen when all the internal organs are damaged, and often irreversibly. The first symptoms are gastrointestinal (digestive system) types, including pain, bloating, diarrhea and vomiting leading to dehydration; in severe cases, hypotension, tachycardia, hypoglycemia, a disorder in a ratio of acid and base properties.

These first symptoms occur after two to three days after consumption. Then, symptoms appear serious damage associated with liver problems: jaundice, diarrhea, delirium, shaking and coma due to sudden liver failure and encephalopathy.

Then it can be occurred cancellation of kidney function or due to sudden and severe hepatitis or because of direct renal intoxication.

Life-threatening complications that can arise are: the scaling up of intracranial pressure, sepsis, pancreatitis, acute renal failure, cardiac arrest. Death occurs 6-16 days after poisoning.

Next pictures shows also other poison mushrooms which we founded in quarry „Ribnica“:



Picture 9. *Amanita verna*



Picture 10. *Amanita pantherina*

Poison mushrooms which appears in quarry „Ribnica“ looks attractive, with attractive colors. They are often toxic, and even deadly toxic mushrooms, pleasant taste. Their appearance in shades that are slightly different from edible is because of the habitat, the intensity of illumination, forest type, and because of climate change.

The third method for achieving the first goal was soil sampling and analysis it of the composition on the Federal Institute for Agropedology in Sarajevo. Because the root system of mushrooms is very shallow beneath the surface of the earth, we took soil samples from a depth of 10-15 cm.

The results of soil analysis shows that the land has a high concentration of humus, which is very satisfactory and above the minimum, so mushrooms can appear on that land. Also the content of other nutrients is at a very satisfactory level. Experts from the Federal Institute of Agropedology pointed out that contents of humus, nitrogen, phosphorus, potassium, calcium, pH reaction of soil and other beneficial nutrients corresponded for the development of fungi in this area.

To achieve the second goal, we have implemented education and interactive workshops for students of primary schools in the municipality of Kakanj which is shown in the following figures. Students are introduced with the quarry „Ribnica“, with it's biodiversity, morphology of mushrooms, types of mushrooms that appear in this area, ways to recognize, and about their importance for the pickers and generally for medicinal purposes.



Picture 11. Education for students

In an interview with the representative of the Association of Agricultural producers "KAP" Kakanj we came up with the idea to create a special section that will gather mushroom collectors from municipality of Kakanj, because currently there is not anything like this. Representatives of this Association expressed their satisfaction and they gave us support in the realization of the second goal. In this way, we will form Association of mushroom collectors that will provide every kind of support in this area (through training, workshops on topics like how to preserve mushrooms, outings to the field, etc.). Also at the meeting was also attended representative of the mountaineers who gave us full support. All of them decided to help us in creating and making one mushroom guide which will help all beginners (from childrens toolder population) in recognizing and collection mushrooms. They also will help us to make education na topic "Correctly picking mushrooms and recognizing them" with agriculture producers all in order to keep mushroom diversity.



Picture 12. Interview with the representative of the

Association of Agricultural producers "KAP" and mountaineers of Kakanj

CONCLUSION:

Project „Caution is mother of wisdom“ opened horizons to all nature consumers to the existence of mushrooms on the narrower and wider area of the quarry „Ribnica“, and also gives a chance for the survival of flora and fauna, and Cement Kakanj strengthened pillar of sustainable development Corporate Mission.

Soil analysis and climate characteristics of the area, indicate favorable conditions for habitation of wild mushrooms.

In order to safer mushroom consuming, mushroom pickers needs to have in their area an experienced connoisseur of mushrooms, something like Association where they can find all informations, and that children are not allowed access to wild mushrooms. In any moment it is necessary to comply all ten mushrooms orders, especially Last "Caution is the mother of wisdom".

LITERATURE:

www.gljive.com/baza-gljiva/page/kategorija/catid/4

www.telegraf.rs/.../1812703-ovo-su-4-najotrovnije-pecurke-u-sr

<https://hr.wikipedia.org/wiki/Kategorija>

www.gljivari.org.rs/Prirucnik_za_sakupljace.pdf

Kakanj, september 2016. god.



prepared:

NGO „Green field“

To be kept and filled in at the end of your report

<p>Project tags (select all appropriate):</p> <p>This will be use to classify your project in the project archive (that is also available online)</p>	
<p>Project focus:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Biodiversity management <input type="checkbox"/> Cooperation programmes <input checked="" type="checkbox"/> Education and Raising awareness <input type="checkbox"/> Endangered and protected species <input type="checkbox"/> Invasive species <input type="checkbox"/> Landscape management - rehabilitation <input type="checkbox"/> Rehabilitation <input type="checkbox"/> Scientific research <input type="checkbox"/> Soil management <input type="checkbox"/> Urban ecology <input type="checkbox"/> Water management <p>Flora:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Conifers and cycads <input type="checkbox"/> Ferns <input type="checkbox"/> Flowering plants <input checked="" type="checkbox"/> Fungi <input type="checkbox"/> Mosses and liverworts <p>Fauna:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Amphibians <input checked="" type="checkbox"/> Birds <input checked="" type="checkbox"/> Dragonflies & Butterflies <input type="checkbox"/> Fish <input checked="" type="checkbox"/> Mammals <input type="checkbox"/> Reptiles <input checked="" type="checkbox"/> Spiders <input checked="" type="checkbox"/> Other insects <input type="checkbox"/> Other species 	<p>Habitat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Cave <input checked="" type="checkbox"/> Cliffs <input type="checkbox"/> Fields - crops/culture <input checked="" type="checkbox"/> Forest <input checked="" type="checkbox"/> Grassland <input type="checkbox"/> Human settlement <input checked="" type="checkbox"/> Open areas of rocky grounds <input type="checkbox"/> Recreational areas <input type="checkbox"/> Screes <input checked="" type="checkbox"/> Shrubs & groves <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Wander biotopes <input type="checkbox"/> Water bodies (flowing, standing) <input type="checkbox"/> Wetland <p>Stakeholders:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Authorities <input checked="" type="checkbox"/> Local community <input checked="" type="checkbox"/> NGOs <input checked="" type="checkbox"/> Schools <input checked="" type="checkbox"/> Universities